

**PATENT**  
Attorney Docket No. 216190

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

LI et al.

Art Unit: Unassigned

Corresponding to International

Application No. PCT/GB00/03964

Examiner: Unassigned

Filed: Concurrently

For: **METHODS AND APPARATUS FOR  
DRIVING A QUADRUPOLE ION  
TRAP DEVICE**

**PENDING CLAIMS AFTER ENTRY OF PRELIMINARY AMENDMENT**

1. A method for driving a quadrupole ion trap device including,  
creating a digital signal,  
using the digital signal to control a set of switches to cause the switches  
alternately to switch between a high voltage level and a low voltage level to generate a  
time-varying rectangular wave voltage,  
supplying the time-varying rectangular wave voltage to the quadrupole ion  
trap device to trap ions in a predetermined range of mass-to-charge ratio,  
varying the digital signal to vary the predetermined range of mass-to-  
charge ratio of ions that can be trapped by the quadrupole ion trap device and  
further supplying to the quadrupole ion trap device a time-varying dipole  
excitation voltage to cause mass-selective resonant oscillatory motion of ions in the  
device.